Childcare Facilities & High Traffic Areas: Any Problems?
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Introduction
This study investigates the location of day care centers in relationship to high traffic road ways. Specifically, this study shows the number and percentage of day care centers that are located in Massachusetts in high traffic areas. The procedure I used was based on a similar study done in California by Douglas Houston called “Proximity of Licensed Child Care Facilities to Near-Roadway Vehicle Pollution” which was published in the American Journal of Public Health.

Generally more pollutants are emitted from high traffic roadways. Numerous studies have shown that young children ages 0-5 are permanently adversely impacted by traffic pollution. Children ages 0-5 are the most fragile because they do not have a complete immune system. For example, one study found girls age 4 months to 4 years exposed to nitrogen dioxide (NO2) near their homes or day care centers may be associated with the development of wheezing bronchitis. Another study of infants revealed significant association between traffic-related air pollutants and cough without infection and dry cough at night in the first year of life.

Data & Methods
I classified each day care center in Massachusetts into one of four categories—high traffic, medium traffic, low traffic, and very low traffic using the following methodology. First I collected the locations of all the day care centers, from the www.mass.gov web site and categorized the locations. Using this procedure, 80% of the locations were mapped and included in this study. Then, from www.mass.gov, I used the census 2000 Tiger Roads layer to rank the roads into the following categories using:

• Primary Roads (high traffic)
• Secondary Roads (medium traffic)
• Neighborhood Roads (low traffic)
• Road Trails (very low traffic)

Each day care center was sequentially located into only one of the above categories starting with high traffic and moving down to the very low traffic areas. For example, if a day care center was located within 200m of the high primary road ways it was considered a high traffic area and removed from the categorization process. This process was sequentially followed until all day care centers were classified into only one of the four categories.

Second, I classified all the day care centers falling in 6 geographical block group areas using census 2000/MassExecs data into high, medium, low, and very low traffic areas. The 6 geographical block group areas are:

• Black Areas-more than 50% Black African American
• Latino Area-more than 50% Hispanic
• Limited English Area-more than 15% of residents with an English proficiency
• Limited Education Area-more than 3% with less than a high school education
• Minority Area-more than 50% non-white residents
• Poor Area-more than 20% of residents living in poverty

Results
In the high traffic area there are 1,087 centers which is 23.65% of the total traffic area centers. In the low traffic area there are 9,951 centers which is 77.13% of the centers. In the very low traffic area there are 541 centers which is 0.00%. There was a trend of 82.27 centers included in my study. In conclusion, approximately 37% of the centers are located in high pollutant medium traffic and high traffic areas. The results for the 6 block groups show a similar and significant percentage among medium and high traffic centers.

Conclusion
A significant number of centers (about 30-40% of the centers in all block groups) are located in higher pollutant areas. In today’s society, effects of road way pollutants on children in day care centers affects everyone across all socioeconomic and race groups—not just minorities and lower socioeconomic classes.

In future planning it may be prudent to locate new day care facilities in areas less susceptible to roadway pollutants. One might also include not only the proximity to high pollutant roadways but also the prevailing wind direction which might magnify the negative effects of the roadway pollution on the center.

Bibliography


Jacobi U. Traffic related pollution and respiratory health during the first two years of life. Eur Respir J. 2002;19:690-698